The Madras Clinical Journal

Vol. XXVIII | NOVEMBER 1961 | No. 5

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INTRODUCTION :

This is meant mainly as a hand book of reference for general practitioners in problems relating to neurology and neuro-surgery. It is hoped that this would serve the purpose of a ready help for those in general practice or those who are in places far away from big medical centres. The aim is to present in a simple way elementary knowledge regarding practical neurological problems, so that the proper advice may be given to the patients and treatment undertaken. This can be used as a reference book when a neurological problem is met with. HENCE YOU ARE SPECIALLY REQUESTED TO PRESERVE THIS COPY OF THIS JOURNAL IN YOUR REFERENCE SHELF.

ELEMENTS OF PRACTICAL NEUROLOGICAL PROBLEMS

B. RAMAMURTHI

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The Madras Clinical Journal

JOURNAL OF THE MADRAS STATE BRANCH OF THE INDIAN MEDICAL ASSOCIATION

(WITH WHICH IS INCORPORATED THE "MISCELLANY")

Vol. XXVIII November 1961 No. 5

ELEMENTS OF PRACTICAL NEUROLOGICAL PROBLEMS

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1. MENINGOCELE AND MENINGOMYELOCELE :

The presence of an abnormal swelling in the back of a new born child comes as a rude shock to the parents. The doctor is often called upon not only to advise regarding the treatment in such cases, but also to act as a comforter to the parents and to explain to them the prognosis.

The swelling may be only a simple defect in the dura and muscles, not involving the nerve elements. Then it is termed a *meningocele.* Trans-illumination is present. The treatment is simple : It is to excise the sac and repair the defect. The prognosis is good. The operation is preferably done when the child is about twelve to eighteen months old.

A more complicated condition is one in which the defect involves not only the skin, muscles and bone but also the nerve elements. As the nerves may not be fully developed, the nerve supply to the parts below the swelling is affected. This condition is known as a *meningomyelocele.* The prognosis is not as good as in a simple meningocele.

It is essential to know certain facts before advice can be rendered.

1. The *extent* of the neurological defect :

(a) **Motor :** The feet may be flail. The infant may not move the leg as much as it normally should which is an indication of motor weakness. This can be noted by observing the child for a few minutes.

(b) **Sensory :** Loss of sensation may be determined by the failure of the child to cry or to withdraw the leg when a pin is pressed against it. Small ulcers may be present in the natal cleft and these may indicate trophic ulcers.

(c) **Visceral :** Loss of control over micturition and defaecation may also be present. This will not be obvious in a small infant. It may be some months before the parents realise

that the child cannot control urine. A look at the anus may show a patulous anal sphincter.

2. The presence of *other congenital abnormalities* like bilateral clubfoot, cleft palate, congenital heart disease, etc.

3. The presence of *hydrocephalus* : Hydrocephalus may be obvious when you see the child and this is due to a co-existing congenital defect in the brain. It may develop some months after birth or after surgery. In all cases of meningomyelocele, it is necessary to keep the child under observation for commencing hydrocephalus.

Treatment : 1. The skin may be ulcerated and may need sterile dressings.

2. There may be cerebrospinal fluid leak. In addition to sterile dressings, antibiotics are to be administered to control infection, till the leak stops.

3. The swelling is protected from trauma by dressing it with plenty of cotton around. A soft rubber cup may also be used.

4. Surgery is best done after 12 – 18 months, though some believe in operating within the first three days of birth.

Late cases : When a child is seen at a later age with neurological deficit caused by a meningocele, orthopaedic treatment for deformities and corrective operations to improve bladder function are useful.

Meningoceles may also occur in the head or in the neck. They may present with or without neurological defects. The principles mentioned for sacral meningocele hold good for these cases also.

Summary : 1. The meningocele may be a simple one or associated with neurological defects.

2. Look for these neurological defects—viz. motor weakness of legs, sensory loss in the lower limbs and perineum or dysfunction of bladder and rectum.

3. Look for associated congenital abnormalities.

4. Surgery is preferably done after the age of twelve to eighteen months.

5. In meningomyelocele explain the prognosis carefully to the parents.

6. If the surface is ulcerated or there is a cerebrospinal fluid leak, antibiotic therapy is immediately advised.

7. Bladder training and orthopaedic care of the lower limbs is essential.

2. HYDROCEPHALUS :

Hydrocephalus may be present at birth or may develop soon after birth. The tragedy is all the more if the mother had to undergo a caesarean section for the delivery of the child.

Hydrocephalus means increased amount of cerebrospinal fluid in the head. This is caused commonly by a complete or a partial block in the circulation of the cerebrospinal fluid. Rarely it is due to excess production of the cerebrospinal fluid.

The head gradually begins to enlarge in size and in some cases goes on enlarging till death overtakes the child. In others the enlargement may stop at a particular size and the head may not grow bigger. Then it is known as *arrested hydrocephalus.* When hydrocephalus is arrested at an early stage, the further growth of the child may be quite normal. The

intelligence may be good despite the head being big. Treatment is required for hydrocephalus only when the head continues to enlarge. This can be ascertained by periodical measurement of the circumference of the head. Hence the most important thing is to chart weekly measurements of the circumference of the head. If the measurement increases, only then should treatment be advised.

Treatment: It may be possible to stop the production of cerebrospinal fluid by cauterisation of the choroid plexus. It is also possible to relieve by operation some varieties of obstruction. Most commonly hydrocephalus is treated by shunting away the cerebrospinal fluid to some other part of the body like the peritoneum, the pleura, the right auricle, etc. (Ventriculo-pleurostomy, ventriculo-peritoneostomy, ventriculo-auriculostomy, etc.). Of these ventriculo-auriculostomy, i.e. short circuiting the cerebrospinal fluid into the right auricle by a valve tube is the most promising.

The prognosis of hydrocephalus in general is still not good. Sometimes hydrocephalus may be due to obstruction resulting from intracranial infections occurring in childhood. By early and vigorous treatment of intracranial infections in infants, this complication is avoided. This is specially true of tubercular meningitis in children.

Once post - meningitic hydrocephalus occurs and is progressive, surgical therapy for the hydrocephalus may be undertaken, if the original infection has been well controlled.

Summary: Only progressive hydrocephalus requires treatment. Hence periodic measurement of the circumference of the head should be done to know whether there is progressive enlargement. Surgery has been useful in many cases, especially the shunting procedures; but still the prognosis is not generally good in hydrocephalus.

3. HEAD INJURIES

Occasionally you may be called upon to treat cases of head injury. These occasions will be more in future as the industrialisation of the country rapidly progresses. As specialist centres are few, the general practitioner has often to undertake to treat or to advise a case of head injury. It is better to remember the maxim that no head injury is so simple as to be neglected or so serious as to be despaired of.

Head injuries are important because the head contains the brain. This means that the prognosis of any head injury is determined by the part of the brain injured and by the amount of damage to the brain.

Fractures of the skull are important because they may affect the brain. *Simple fissured fractures* of the skull do not require treatment. X-rays of the skull to show simple fractures are necessary because of medico-legal requirements. Fissured fractures heal by fibrosis.

Simple depressed fractures of the skull are caused by blunt instruments. These are common in infants and children. Difficult labour may cause a depressed fracture in a new born infant. In very young infants they may be left alone, as they usually get corrected. In others it is better to advise operative correction. This is advised because the depressed bone may irritate the brain and cause trouble like epilepsy in later life.

These fractures also require treatment for cosmetic purposes e. g., depressed fracture in the forehead.

Compound fractures of the skull are emergencies. They require immediate surgical attention. This is so because:

(a) The underlying brain may have been damaged.

(b) Bleeding may occur under the wound.

(c) Infection may spread from the exterior to the brain causing meningitis, brain abscess, etc. Hence it is essential that surgical treatment be given to compound fractures of the skull as early as possible. If you are far away from a centre where such aid is available, you can give the patient a large dose of antibiotics, then dress the wound with sterile dressings and send the patient to an institution.

In treating compound fractures, the surgeon clears all the debris from the wound and removes loose bits of bone. If the dura is torn, the underlying brain is examined and pulped brain removed. After haemostasis the dura is closed and then the wound is closed in layers. Such careful attention prevents complications like brain infection and epilepsy.

Closed head injuries: The prognosis of a head injury depends upon the part of the brain damaged and the amount of damage. When the brain stem is seriously injured, the prognosis is very bad. On the other hand, if the injury is confined to the hemisphere, the patient may completely recover.

The other important consideration in head injury is the occurrence of haemorrhage inside the skull. The bleeding that occurs in the skull outside the dura mater or under the dura mater forms a haematoma. The haematoma gradually increases in size till it begins to compress the brain. When the compression is unrelieved, death may supervene; but if the compression is relieved, dramatic recovery ensues. Hence a wise doctor always looks for evidence of compression in every case of head injury.

The most important sign in a case of head injury is CONSCIOUSNESS. Always determine the level of consciousness and make a careful note. If the patient was unconscious from the time of injury, then probably he has had a severe injury to the brain. If the patient was unconscious first and then recovered consciousness, that means the brain was not seriously injured and he would do well. If the patient was conscious and then became unconscious, it means there is compression of the brain. This is a most important sign. Deepening unconsciousness means compression of the brain. Try to relieve the compression immediately. To know where the compression occurs, localising signs often help. If one pupil is dilated, if one side of the body is paralysed, or if one portion of the body shows twitches or convulsions, the site of the compression may be deduced.

Compression is relieved by making a small burr hole over the suitable area of the skull and letting out the clot. It is as emergent as a tracheotomy. It should be possible for any doctor to make such a hole in the skull to relieve the compression and save life.

If the patient is *unconscious throughout*, then you should:

(a) Keep the air passage clear. The tongue is kept pulled out and the throat is prevented from falling

backwards by being cleared of all mucus; use an air way, if there is one available.

(b) Feed by nasal tube. An unconscious man needs nourishment.

(c) Control the temperature, if necessary by ice bags or cold water.

(d) Administer antibiotics.

(e) Always look for other injuries to other parts of the body, e. g., abdominal injury, thoracic injury, fractures, etc. and the necessary treatment has to be arranged.

Restlessness: A patient with head injury may become restless. In such cases, the cause of restlessness must be first sought for. A full bladder, an empty stomach, an unrecognised injury elsewhere causing pain, must be treated, if found. Paraldehyde is a safe drug to be administered, and repeated as often as necessary. Lumbar puncture may help in controlling restlessness.

4. INTRACRANIAL TUMOURS:

These are broadly spoken of as intracranial space occupying lesions and include neoplasms, abscesses, haematomas, granulomas, etc. They cause symptoms in two ways:

(A) By increasing the intracranial pressure

(B) By focal damage to the brain

(A) *Increased intracranial pressure:* The skull is a closed cavity and any extra matter accumulating inside will increase the intracranial pressure and compress the brain.

Intracranial pressure may also increase by the lesion blocking the cerebrospinal fluid pathways. When the intracranial pressure rises, it causes the following symptoms:

1. **Headache:** Headache is a common symptom seen in general practice and is often due to simple causes. But it is also a symptom of an intracranial tumour. Hence when headache is not relieved by ordinary means, you must think of increased intracranial pressure. Commonly such headache is worse *in the mornings.* It also gets worse on stooping or bending forward. This headache may be in the temporal region or the frontal region or it may be at the back of the head or the neck. Pain or ache in the back of the neck is of a very serious significance. (Take immediate action in cases of pain in the back of the neck).

2. **Vomiting:** Vomiting is also a sign of increased intracranial pressure. If, in any case of vomiting you cannot find any reason for the vomiting in the food or in the gastro-intestinal tract, immediately think of the brain. This *is more important* in children. Vomiting may be the earliest sign of raised intracranial pressure in children. Children may not complain of headache or dimness of vision. Hence in any unrelieved vomiting, think of intracranial causes.

3. **Dimness of vision:** This is a most important and tragic sign. Intracranial pressure must be diagnosed before vision begins to be affected. At least after the vision is affected, you must think of intracranial pressure. Only when the intracranial pressure has persisted for sometime, it affects the optic nerves and then leads to dimness of vision. When the patient begins to complain of dimness of vision, already some weeks have passed since the optic nerves began to get affected. So dimness of vision is an emergency and requires immediate investigation.

The only way to diagnose pressure on the optic nerve is TO USE THE OPHTHALMOSCOPE. This instrument is worth its weight in gold, because by this instrument you will save a number of lives; more than lives, you will save vision. Please use the ophthalmoscope in every case of suspected neurological disease. This is a most important maxim.

In increased intracranial pressure, the optic disc becomes hyperaemic and its margins look blurred. This is known as papilloedema, caused by obstruction to the venous return of the optic nerve and retina. When papilloedema persists for a long time, it goes on to atrophy and the patient becomes completely blind. In papilloedema, the field of vision contracts all round the periphery.

When intracranial pressure remains unreleased for months, it ultimately leads to loss of consciousness and death.

B. *Symptoms due to focal damage:* The second set of symptoms of space occupying lesions is caused by the lesion causing changes in the brain itself. The lesion may irritate the brain and cause focal irritative signs e. g., focal convulsions. When the lesion leads to loss of function of a part of the brain, the patient exhibits progressive loss of a particular function e. g., gradual increasing paralysis of one limb, gradual loss of vision in one eye, gradual loss of hearing in one ear, gradual loss of memory, etc. By examining the patient and noting down his defect, you can form an idea of where the lesion is arising from.

In every case of suspected intracranial pressure, whether there are any focal signs or not, it is essential to immediately forward the patient to a suitable centre for further tests and treatment. Delay will make the prognosis worse. This has to be emphasised to the patient and his relatives. Once the patient loses his eye sight, he is not grateful to you even if his life is saved by heroic surgery later on.

The common signs and symptoms of intracranial tumours are:

1. Headache
2. Vomiting
3. Dimness of vision
4. Focal epilepsy
5. Progressive loss of function in any part of the body
6. Hallucination, mental changes, loss of memory, etc.

When any neurological lesion is gradually progressive, then it must be understood that there is a gradually growing lesion in the nervous system.

In children: In children, in addition to the symptoms that have been described, the common symptom will be difficulty in walking. If any child who has been normal begins to trip or fall unnecessarily without a sufficient cause, you must suspect an intracranial lesion.

Children do not complain of dimness of vision unless they are of the school going age. Hence you should not wait for this symptom to set in. Children may not often complain of headache. An enlarging head may also be indicative of an intracranial lesion in children. Vomiting is a common sign of intracranial pressure in children.

The methods of investigation of intracranial tumours are as follows:—

1. A complete neurological and visual examination (fundus and fields).

2. Plain x-rays of skull.

3. Electro – encephalography — (to record the electrical action of the brain). Figures 2 & 3.

4. Ventriculography - (by introducing air into the ventricles, their shape and size are outlined).

5. Angiography-(by injecting a radio-opaque dye in the carotid or the vertebral artery) Fig. 4. X-ray pictures can be taken to show the pattern of the blood vessels. By these aids at our disposal, we are able to accurately localise the lesion and then remove it by operation.

The intracranial tumours include not only new growths but also other space occupying lesions like haematoma, abscesses, tuberculoma, etc, Tuberculoma is a common intracranial tumour in our country and it responds very well to antibiotics and surgery. The other common tumours are meningiomas that arise from the dura and gliomas that arise from the brain substance. The other common tumours are the neurofibromas arising from the 8th nerve and tumours that arise in the pituitary region. 8th nerve tumours cause deafness. By pressure on the adjacent fifth nerve, they cause corneal anaesthesia as an early symptom. So in every case of deafness look for corneal anaesthesia and, if present, the patient must be advised investigation. Pituitary tumours are common and cause symptoms by pressure on the optic nerve, by endocrine changes and by increasing the intracranial pressure.

Often you may have to advise a patient with intracranial tension, because on your advice will depend his line of action. YOU MUST ADVISE HIM TO GET INVESTIGATED AND TREATED EARLY. It is useful to remember that intracranial surgery has advanced greatly and the mortality is much less than before. The one factor on which the mortality depends is EARLY DIAGNOSIS. In early cases of intracranial tumours, prognosis from surgery is excellent, provided the lesion is not malignant. But when the case is diagnosed late, the risks correspondingly increase. The most tragic situation is one in which the patient has lost his vision. Even after successful surgery, blind patients often say "why did you operate ? Why did you not allow me to die, if you could not give me my eye sight ? Who will support me now — a blind man? " This tragedy could be avoided by only one way and that is by your using the ophthalmoscope and thinking of intracranial lesions.

Summary :

1. Intracranial tumours are common.
2. Early diagnosis is most important. This is done by —
   - (a) bearing in mind the possibility of intracranial tumours.
   - (b) by using the ophthalmoscope in every neurological condition.
   - (c) by carefully examining all cases of headache, dimunition of vision, vomiting, progressive neurological paralysis and focal epilepsies.
3. Earlier the diagnosis, better the prognosis.
4. Don't forget the ophthalmoscope.

5. BRAIN ABSCESS

Brain abscess can be an emergency and quick treatment will save life.

You can diagnose the brain abscess, only if you keep the possibility of its occurrence in your mind. Infection may reach the brain :

(a) from outside e. g., compound fractures of the skull

(b) from the surrounding sinuses e. g., from an infected mastoid or or an infected frontal sinus

(c) through the blood stream from anywhere in the body.

Brain abscess following compound fracture is not difficult to diagnose.

Otogenic Brain abscesses : (Arising from the ear) are sometimes missed because the intracranial symptoms may come much later than the ear infection. In a case of known ear infection, if the patient complains of headache, you must think of a brain abscess or meningitis. Similarly in every case of intracranial tension, it is wise to enquire about a history of ear infection, because the lesion could be a brain abscess.

Infection from the ear may go to the cerebellum causing cerebellar abscess or to the temporal lobe causing temporal lobe abscess. In cerebellar abscess, there will be incoordination of the upper limb. In temporal abscess, there will be a hemiparesis on the opposite side. In both cases unless the pus is released quickly, unconsciousness may occur followed by death.

The patient will look ill and in pain. The pulse is fast. There may be low fever. There may be ear discharge or the ear may be dry. Neck rigidity will be present if there is an associated meningitic process. Blood count may not show leucocytosis.

Severe frontal sinus infection may lead to an abscess in the frontal lobe. The patient will develop neurological signs following severe frontal headache for a few days. The common symptoms are lack of initiative, lack of judgement and unrestrained behaviour. The patient may also develop incontinence of urine. This should point to a frontal abscess.

Haematogenous abscesses caused by infection elsewhere in the body are not easy to diagnose. The lung is a common source of infection. Lung abscesses and bronchiectasis may lead to brain abscesses.

Treatment : Large doses of antibiotics should be administered the moment you diagnose the intracranial infection. The antibiotics themselves may control the infection. During this period, a careful watch must be kept over the level of consciousness of the patient. If there is papilloedema, lumbar puncture should not be done except by a person who will take the responsibility of operating if anything untoward should happen. When pus is localised, it must be let out immediately by a competent person. This is done by making a burr hole over a suitable area of the brain and tapping the abscess by a brain needle. The prognosis of brain abscess is good after the advent of antibiotics.

6. USE OF THE OPHTHALMOSCOPE :

This is a very important topic and requires to be stressed. The ophthalmoscope is an instrument that must be possessed by every doctor and not only by the opthalmologist. In all advanced countries a medical student buys an ophthalmoscope along with a stethoscope and all practitioners of medicine possess and use an ophthalmoscope. The importance of this will be realised if you go through the following paragraphs.

By the use of the ophthalmoscope, we are able to visualise the retina and the beginning of the optic nerve. We are also able to see directly the condition of the blood vessels. The optic nerve is developmentally a part of the brain, so that the optic nerve reflects changes that occur in the brain. Thus, in the ophthalmoscope, we have a direct method of looking at a portion of the brain. This is indeed a great boon as one can diagnose diseases inside the cranium long before symptoms appear. Thus one can diagnose various types of INCREASED INTRACRANIAL PRESSURE and tumours. This has been pointed out in the respective chapters.

The ophthalmoscope is useful not only to diagnose intracranial pressure, but it also gives us an indication about various other conditions. Looking at the blood vessels in the retina you can appreciate the changes that are occurring in the vascular system all over the body. *Arteriosclerosis* can be identified. Changes that occur in the blood vessels in *High Blood Pressure* can be seen and we are able to judge the prognosis of a hypertensive patient by using the ophthalmoscope.

The ophthalmoscope is also useful in general diseases like *Diabetes, Nephritis,* etc. The changes that occur in the tissues of the body are reflected in the retina and thus there is a direct method of visualising such changes. In other diseases like *Tuberculous Meningitis,* choroid tubercles may be seen. Hence the ophthalmoscope is an instrument that is generally useful.

Technique: The technique is not difficult. It is not usually necessary to dilate the pupils to look at the fundus. The optic disc and the retina can be seen in a room with subdued light through a moderately contracted pupil. In certain persons in whom the pupils are strongly contracted, it may be necessary to use homotropine.

If the patient looks slightly medially, the optic disc is directly behind the pupil. The colour of the disc, the margins and the blood vessels are noted.

Primary optic atrophy : Disc margins clear, colour white, vessels normal or narrowed.

Papilloedema: Disc margins indistinct, colour pink, full veins.

Secondary optic atrophy : Disc margins indistinct, colour pale white, vessels narrowed and indistinct.

Lastly, I would like to emphasise that by the constant use of the opthalmoscope, early diagnosis of intracranial lesions can be made. This means better prognosis and avoidance of blindness. No patient is grateful if you save his life but not give him vision. Hence use the opthalmoscope and earn the everlasting gratitude of your patient.

7. ELEMENTARY NEUROLOGICAL EXAMINATION :

There is an impression unfortunately created that a neurological examination is difficult. This impression is fostered very early from undergraduate days. It is my duty here to dispel such an impression and to point out how interesting and easy a neurological examination can be and how useful it is for the patient.

Neurological examination is divided into three major sections.

1. Higher functions
2. Cranial nerves
3. Spinal nerves.

1. **Higher functions:** Higher functions will include intelligence, memory, co-ordination and speech. The status of these can easily be judged while you are talking to the patient or his relatives.

2. **Cranial nerves:** *The first nerve:* (Olfactory) is tested by testing the sense of smell. Use mild agents. Strong agents like oil of cloves, do not give a correct picture as they stimulate the trigeminal nerve endings also.

The second nerve: (Optic nerve) (i) *Fundus appearance:* The ophthalmoscope is the most important instrument to be used. Optic atrophy or papilloedema could easily be diagnosed.

(ii) By questioning the patient, the *acuity of vision* can be determined. Reading a book or big letters at a distance (e. g.) in a calender in your consulting room will also indicate the acuity of vision.

(iii) *Fields of vision:* This is determined in a simple fashion. The patient sits about a yard in front of you, closes one eye and fixes the other eye on the tip of your nose. Now by moving your finger in his field of vision and noting whether he sees the finger or not, you can determine whether his fields of vision are full or contracted in any particular direction.

3rd, 4th and 6th nerves:

1. Presence of double vision.
2. Presence of squint.
3. Impairment of movement of the eye ball.
4. State of the pupils and reaction to light.

In third nerve weakness, the patient may have only a drooping of the lid or most movements of eye-ball and pupil may be lost. In fourth nerve weakness, looking downwards will be difficult. In sixth nerve weakness, the patient cannot move the eye outwards.

5th nerve: *Sensory* is determined by testing the sensations on the face by using cotton wool and pin. Corneal sensation *must be* tested; use a wisp of cotton wool for this.

Motor: By testing the movement of the jaw and feeling the contraction of muscles of mastication when the jaw is clenched.

7th nerve: Facial paralysis: (a) *Lower motor type* — The facial nerve is itself affected. So there will be paralysis of all the muscles supplied by the facial nerve; the whole of one half of the face will be paralysed. This is tested by:

1. Wrinkling the forehead
2. Closing the eyes
3. Showing the teeth
4. Blowing air from the mouth.

(b) *Upper motor type:* If the paralysis is confined only to the lower half of the face, then the lesion is above the facial nerve nucleus in the brain i. e. an upper motor paralysis.

8th nerve: It has two functions.

1. Hearing is tested by a ticking watch or a tuning fork.
2. Vestibular: This serves the function of equilibrium. Difficulty in maintaining equilibrium or the presence of nystagmus may give a clue.

9th nerve: Test sensation in the posterior part of the tongue and the palate.

10th and 11th nerves: Test palatal movements by asking the patient to say 'Ah'

1. Regurgitation of fluids through the nose indicates palatal weakness.
2. Change in the voice will indicate laryngeal weakness.
3. Difficulty in swallowing may be present.

12th nerve: Test the movements of the tongue. In 12th nerve paralysis, the tongue muscles of the same side are wasted. They are not able to push the tongue towards the opposite side. Hence the tongue deviates to the same side.

3. **Spinal nerves:** The function of the spinal nerves is tested in the following regions—upper limbs, lower limbs and trunk. The functions to be tested are motor and sensory and reflexes—visceral and autonomic.

Motor: 1. *Power of muscles:* This is tested by the patient moving the various joints with and without resistance and testing the power in the muscles.

2. *Tone:* By passively moving the joints of the limbs, it is ascertained whether the tone is increased or not. When the tone is uniformly increased throughout the movement, it is called rigidity indicating an extra-pyramidal lesion. When the increased tone suddenly lessens towards the end of the movement, it is called spasticity (clasp knife rigidity) indicating a pyramidal lesion. In cerebellar lesions, the tone is diminished.

3. *Co-ordination:* All muscles should act in co-ordination with each other. If this is lacking, the movement becomes jerky and is executed in a haphazard manner. Co-ordination in the upper limb is tested by asking the patient to touch the tip of his nose with his index finger and in the lower limb, by placing the heel of one foot on the opposite knee and bringing the heel down along the shin.

Sensory: Different sensory impulses are carried by different tracts. It is necessary to test separately for the following sensations:

- (i) Touch (cotton wool)
- (ii) Pain (pin prick)
- (iii) Heat (test tube containing hot and cold water)
- (iv) Vibration (tuning fork)
- (v) Sense of position. This is tested as follows: The patient is asked to close his eyes; then the examiner moves the joint. The patient should be able to say in which direction the joint was moved, if his sense of position is normal.

Reflexes: In the upper limb, test for biceps, triceps and radial reflexes and in the lower limb, test for knee jerk, ankle jerk and plantar reflexes. In the abdomen, the abdominal reflexes are to be tested.

Visceral reflexes: Bladder function and rectal function should be enquired into. A rectal examination will show the nature of the anal sphincter.

Autonomic: (a) Note whether the part sweats, whether the limb is cold, whether the colour is normal, dusky or red.

The above examination may be done rapidly and accurately in about ten to fifteen minutes in the out-patient department of a hospital or in your consulting room. The stress on the various aspects of this examination will vary according to the complaints of the patient, e. g. in a case of paraplegia, it will be necessary to test accurately the various levels of sensation, whereas such elaborate testing may not be necessary in another case.

(b) In every neurological case, other systems are also to be tested.

8. PHYSIOTHERAPY AND REHABILITATION:

This topic is of the greatest importance, because recovery of function in any patient after neurological disease depends to a great extent on the state of the muscles, tendons and joints. When neurological power is gradually returning, the nerve impulses can act on the muscles only if the muscles, tendons and joints are supple and efficient. If the muscles have been allowed to stretch beyond their normal capacity or if the joints and tendons have been allowed to develop contractures, then the limb becomes useless. In such a state even though neurological recovery occurs, functionally the recovery will be minimal.

Unfortunately this aspect is not sufficiently emphasized or practised by allopathic doctors. Part of the popularity of the Ayurvedic physicians in the treatment of neurological diseases is due to this fact that they lay great stress on massage and movements of paralysed limbs.

Unless the physician realises the importance of physiotherapy and also impresses it on the patient and his relatives, full benefit from the treatment cannot be achieved.

Whatever may be the cause of paralysis either cerebral diseases as in hemiplegia or spinal disease as in paraplegia or due to nerve injuries, the following aspects must be kept in mind.

1. *Support by splints:* It is essential to keep the muscles in a neutral position and not to allow them to stretch too much, e. g. in a wirst drop following radial nerve paralysis, the wrist must be supported in a slightly dorsi-flexed position. This is as important as every other treatment. If the wrist is allowed to be in the dropped position, the muscles and tendons get stretched and cannot function efficiently later on, when the radial nerve recovers. Each joint has a particular position in which the muscles around it can be kept in the optimum position.

Shoulder	...	abduction to 80°
Elbow	...	flexed to 90°
Wrist	...	slight dorsi-flexion
Fingers	...	to be kept in semi-flexed position as if holding a ball
Knee	...	extension
Ankle	...	with foot at right angles to the leg.

2. *Massage and passive movement:* In addition to the support given to the muscles by proper splinting, it is also necessary to give gentle massage to the limb and move the joints at least three or four times a day. This movement helps in keeping the tendons and muscles and joints supple.

In completely paralysed patients or in unconscious patients also the above method of massage and movements are essential. They serve :

(a) to keep the circulation efficient

(b) to prevent development of pressure sores

(c) to prevent congestion of lungs.

3. *Active movement :* The patient should be encouraged to move the limb by himself. Though apparently no movement may take place in the paralysed limb, every effort by the patient to move the limb actively hastens recovery. This is because of the re-establishment of the connection between the mind and the limb.

In addition to active and passive movements, if the patient is given some occupation in which he can try to use the affected limb, then recovery is quicker. This is accomplished by rehabilitation.

Physiotherapy and rehabilitation centres are few in our country. If possible, the patient may be sent for a few days to one of these centres where he can learn what exactly is to be done. But this is possible only in a few cases. In our country it is the family doctor who has to take this responsibility. Depending on the circumstances of the patient and his interest, the doctor should suggest some occupation every day which will make him use his limb.

Summary : Massage and movements are essential methods of treatment of the paralysed limbs. The doctor must teach the patient and his relatives how to keep the muscles and joints in a supple condition. The paralysed muscles must be supported by splinting the joints in a proper position. Gentle massage for the muscles and movement for the joints three or four times a day.

Encourage active movements by the patient.

9. DISEASES OF THE SPINAL CORD :

The spinal cord is an important structure because many nerve tracts are concentrated in the spinal cord which is not thicker than a finger. Hence small lesions in the spinal cord may cause widespread symptoms.

The spinal cord begins at the foramen magnum and ends at the first lumbar vertebra. Below the first lumbar vertebra, the nerve roots occupying the spinal canal resemble a horse's tail and hence are called the cauda equina. The spinal cord is arranged in segments with a pair of nerve roots arising from each segment on each side. In addition to these segments, which also contain the anterior horn cells, the spinal cord carries long tracts from the brain carrying motor impulses and long tracts to the brain carrying sensory impluses, tracts carrying autonomic impulses and tracts carrying visceral impulses. Hence in a lesion of the spinal cord, there may be the following changes :

1. Motor
2. Sensory
3. Autonomic
4. Visceral changes.

If the spinal cord in the cervical region is affected, all the four limbs and the trunk are affected. This is called quadriplegia. If the thoracic spinal cord is affected, the lower limbs are paralysed. This is called paraplegia. In quadriplegia and paraplegia, the limbs are spastic because the pyramidal tract is involved. In lesions of the cauda equina, the lower limbs are flaccid.

Examination of a case of paraplegia :

1. *Motor :* Examine the extent of weakness. Always look at the upper limb, even though the patient complains only of weakness of the lower limb. A small wasting in the upper limb may indicate to you that the lesion is in the cervical region and not lower down. Determine whether the jerks are exaggerated or lost.

2. *Sensory :* By using cotton wool, a pin and a tuning fork, try to find out up to what level sensation is lost. This gives a clue to the level of the lesion.

3. *Autonomic :* The patient's skin will be cold and there will not be any sweating below the level of the lesion.

4. *Visceral :* The patient may have incontinence of urine, dribbling of urine. Weakness of the anal sphincter is known only by a rectal examination.

Lesions :

Compression syndrome : This is a very important syndrome. This is important because, if compression is recognised and relieved, the patient will recover. The compression may be caused by lesions outside the duramater, inside the duramater or inside the cord.

Usually the onset is slow. The symptoms spread from one limb to the other or gradually upwards. The symptoms progressively deteriorate. Motor, sensory and visceral functions are involved in late cases. Motor function alone may be involved in early cases.

Causes of cord compression :

Extradural : Cold abscess due to tuberculomas is a common cause. Fracture of the vertebra, infection or abscess due to non-specific causes and tumours of vertebra and extradural tissues also cause cord compression.

Intradural: Meningioma and neurofibroma are the commonest tumours.

Intramedullary: Tumours may arise in the substance of the cord e. g. glioma. Occasionally fluid accumulates inside the cord known as syringomyelia.

When a lesion starts in the extradural or extramedullary space, the nerve root may be involved first. Then the patient will experience pain along the nerve root. This is known as *root pain.* Radiation of the root pain will depend upon the part to which the nerve root goes. In the upper cervical region, the pain will radiate to the back of head and neck and in the lower cervical region to the arm. In the thoracic region, the pain is referred to the chest, abdomen and groin. In the lumbar and sacral regions, the radiation is via the gluteal region to the thigh, the leg or the foot. Such pain is also known as referred pain.

Root pain may occur alone initially, and may persist for a long time before other symptoms appear. Such pain should not be mistaken for disease in the local part, e.g. root pain along the fourth dorsal may be mistaken for angina pectoris, pain along the abdominal wall for appendicitis, etc. Root pains are important clinically as they indicate the level of the lesion in the spinal column.

Bladder function is usually affected late, as the fibres are deep in the cord. If the bladder is affected first, then the prognosis is not good because it means that the lesion is inside the spinal cord.

Onset of acute paraplegia:

(i) *Fracture spine:* History is obvious.

(ii) *Transverse myelitis:* When paraplegia occurs suddenly and rapidly without trauma, it is most likely to be due to thrombosis of a blood vessel supplying the spinal cord. This thrombosis may be due to syphilis. It may also be due to other general causes which may cause thrombosis. It may also be due to infection outside the spinal canal, e. g. *an acute epidural abscess* outside the dura may cause sudden paraplegia. If such an abscess is recognised and the pus released, recovery may occur. Hence, even in acute paraplegia, a lumbar puncture is essential to determine the cause.

(iii) *Infective polyneuritis:* In this the paralysis spreads from below upwards fairly rapidly. It may start at any level. Sensory loss is also predominant. Bladder function may be impaired. Lumbar puncture shows increased proteins, but no block and no cells. This is probably due to an allergy. Recovery is usual. Cortisone is indicated. In acutely ascending cases, respiratory muscles may be involved. Such cases may require artificial lung for a few days till the process subsides.

(iv) *Poliomyelitis:* Poliomyelitis involves the anterior horn cells. The onset of paralysis is rapid and then gradually partial recovery occurs. The muscles are flaccid. There is no sensory loss. Treatment is prevention by vaccine. Attention to muscles is essential—refer physiotherapy.

(v) *Cervical spondylosis:* In disease of the cervical vertebra like osteoarthritis, the intervertebral disc gets diseased. It may compress the spinal cord and cause symptoms of quadriplegia. This may be mistaken for a system disease of the spinal cord. (Refer below)

In spinal cord disease caused by cervical spondylosis, correct diagnosis followed by surgical decompression benefits the patient.

(vi) *System diseases of the spinal cord:* Diseases like subacute combined degeneration, lateral sclerosis, disseminated sclerosis, etc. cause spinal cord symptoms.

(vii) *Motor neuron disease:* If the patient has only motor paralysis of slow onset, if there is wasting and fibrillation associated with increased jerks, then it is likely to be motor neuron disease (progressive muscular atrophy, or amyotrophic lateral sclerosis).

Lumbar puncture: Lumbar puncture is an essential method of investigation. Unfortunately many medical men fight shy of doing a lumbar puncture and postpone doing it, to the detriment of the patients.

Lumbar puncture must be done without fail, (1) when you suspect meningitis, and (2) in paraplegia.

In early meningitis (specially tuberculous), there is no method of diagnosis except by a lumbar puncture and by examining the cerebrospinal fluid. Early diagnosis will lead to quick recovery. Missing the diagnosis by not doing a lumbar puncture leads to grave morbidity. Postponing lumbar puncture may even be termed neglect.

In spinal cord diseases, lumbar puncture is essential. When you do a lumbar puncture, it is necessary to press on the jugular veins and see

whether the pressure of the cerebrospinal fluid in the needle increases. Normally, except when there is a block, the pressure will rise with the rising venous pressure. This is known as the Quickenstedt's test. When there is a block, the pressure will not change despite jugular compression.

Before doing a lumbar puncture, always examine the fundus.

Technique : Lumbar puncture is a simple procedure. It must always be done under local anaesthesia. The patient is kept on his side; the knees and hips are flexed and the neck gently flexed. The needle is introduced in the midline along the tip of the lower spinous process and pointed slightly obliquely upwards. In this position of the needle, lumbar puncture rarely fails. After lumbar puncture, it is necessary for the patient to be at rest for a day.

Summary : Lumbar puncture is essential. It must be performed when there is a suspicion of meningitis or any spinal cord disease. It should not be postponed.

10. EPILEPSY :

Epilepsy is a fairly common disease. At the present day, most of the causes of epilepsy could be treated by proper medication.

Epilepsy is due to an irritation in some neurons in the brain. This irritation leads to the discharge of an electrical impulse which spreads all over the brain and excites the neurons to act simultaneously. This leads to convulsive movements.

This irritative focus is most often in the depth of the brain. In such cases, the first symptom due to the abnormal discharge will be loss of consciousness. Epilepsy whose cause is not clear is known as idiopathic or primary epilepsy. If the irritative focus is in other portions of the brain, specially nearer the cortex, then the epileptic attack will start in a particular portion of the body (focal epilepsy) e. g., a feeling of numbness may start in the right thumb and progress upwards to involve the whole limb to be later followed by unconsciousness and fits.

It is not clear why the focus of irritation should form in the depth of the brain in a case of idiopathic epilepsy. Injuries during birth may be one of the causes. Other diseases like abscesses, arteriosclerosis, tumours, aneurysms, and head injuries may result in an irritable focus in the brain.

Symptomatology :

(i) *The grandmal or major epilepsy :* This is characterised by loss of consciousness followed by tonic and clonic contractions. The attack may be accompanied by frothing in the mouth and incontinence of urine. The most important thing to find out is how the symptoms start. This gives a clue to the site of irritation in epilepsy.

Certain forms of grandmal may occur in a small way i. e., a minor attack of a grandmal: The patient may have only a transient symptom (abdominal pain, headache, sense of fear, palpitation, etc.,) which may be mistaken for some other complaints or for petitmal. In doubtful cases, electro-encephalogram will provide the answer. If electro-encephalogram is not available, then a therapeutic trial will help in diagnosis.

(ii) *Petitmal :* In petitmal, there is an interruption of the stream of consciousness. The patient loses

touch with the surroundings for a few seconds and then rapidly recovers.

In investigations of any case of epilepsy, it is essential to find out whether there is an irritable focus. Careful clinical examination is necessary. Fundoscopy is absolutely essential. Other examinations like x-ray, electro - encephalography, angiography, etc., are done if indicated. As epilepsy may be the symptom of a deep - seated disease, it is essential to investigate the case properly.

If investigation shows an organic cause (e. g., aneurysm, cerebral scar, tumour, etc.), the appropriate treatment should be given. On the other hand, if no organic cause or focus could be diagnosed, administration of drugs or anti-convulsants is the chief method of treatment. The rationale of drug treatment of epilepsy in the present day is to prevent the surrounding brain from being affected by the abnormal discharges of the irritable focus. Most of the drugs that are being used in epilepsy serve the above function.

Potassium Bromide: Potassium Bromide was the earliest anti-convulsant drug. It was found useful in many cases to reduce the frequency of convulsions. The chief difficulties were the sleep induced by the bromides and the toxic effects of prolonged bromide administration. As a result of the advent of recent drugs, bromides have largely been given up in the treatment of epilepsy, but they find a place even now in the mangement of some intractable cases.

Barbiturates: Phenobarbitone is the chief drug in this group. It has been found to be of immense value in controlling most convulsions. It is also of value in treating acute cases, as injectable barbiturates are available. The chief drawback of the barbiturate group of drugs is the tendency to induce sleep in many patients in doses that are required to control the fits.

Hydantoinates: The hydantoinate group of drugs form the chief basis of the present day treatment of epilepsy. Diphenyl hydantoin is marketed under various names like Dilantin, Phenytoin, Eptoin, etc. A dose of 0·1 gram twice or thrice a day is found sufficient is most cases. The value of hydantoin is that in the majority of patients, it does not induce sleep or drowsiness. The best combination has been found to be hydantoinates with phenobarbitone 0·1 gram or 1½ grains of dyphenyl hydantoin with 30 to 50 mgs or grain ½ of phenobarbitone at bed time forms an ideal combination.

In cases which do not respond to the above, the dosage may be increased up to about 4 to 6 tablets of diphenyl hydantoin (0·1 gram) and to about 100 or 150 mgs of phenobarbitone, provided this does not make the patient drowsy.

Mesantoin (methyl hydantoin) is also of value in combating epilepsy.

Mysoline or primidone has been discovered recently as an anticonvulsant drug. Our experience has been that Indian patients do not tolerate mysoline, as well as other groups of patients reported in the literature. Giddiness and drowsiness may come on even with a small dose of primidone, but in certain cases it has been found to be an useful adjuvant to other drugs. Certain other drugs like phenurone, etc are also useful in combating epilepsy, but require careful supervision. *The drugs have to be*

taken continuously, every day without a break for a minimum period of 3 to 4 years. This is the only way in which a cure may be effected.

The diones : All the above drugs refer to the control of grandmal type of epilepsy. In petitmal epilepsy the specific drug is trimetha-dione and parametha-dione known respectively as Tridione and Paradione. The usual dosage is 0·3 gram 2 or 3 times a day. In typical petitmal, the results are dramatic.

Toxic symptoms : When these drugs are being administered, it is very necessary for the patient and his physician to be vigilant for the production of toxic symptoms. This is specially important with regard to the diones. Toxic manifestations may come either after prolonged administration of the drugs or even after the first few doses.

Gastritis, nausea, vomiting, diarrhoea, giddiness and ataxia may be the manifestations of hydantoin toxicity. Occasionally, hydantoinates may depress the bone marrow and cause agranulocytosis. This is specially to be watched when tridione is being administered. Hypertrophy of the gums is seen in many patients receiving hydantoinates. This is no contraindication for the treatment. Daily hygienic care of the teeth and the gums and mouth with regular masssage of the gums often prevent the hyperplasia.

Other precautions : In addition to drug administration, certain other precautions have been found to be useful in reducing convulsions. Indigestion, constipation and lack of sleep should be prevented. The stimulants like coffee, tea and spirits should be restricted.

In addition to the medical treatment of epilepsy, it is very essential to look after the social and the educational aspects of the life of an epileptic. He must be given all opportunities of improving his education. The co-operation of the educationist is very essential. Later when he seeks employment, every opportunity must be given for the epileptic to get a useful employment. Education and useful employment prevent mental strain and inferiority complex in the epileptic. Such strain itself may induce an epileptic attack. The society owes it to its disabled to encourage them to attain as near to *normality* as possible and the epileptics deserve all our consideration and help.

11. CONVULSIONS IN CHILDREN :

Convulsions in children are common. They may be of simple or serious significance.

Some children get convulsions whenever body temperature goes up. This is similar to the occurrence of a rigor in an adult and is of no serious significance. These children must be *given a small dose of phenobarbitone for a few days every time a fever is suspected.*

Convulsions in children may be due to extracranial or intracranial causes.

(a) *Extracranial causes :* (1) Infections elsewhere in the body - e. g., respiratory infection, mastoid infection, etc., (2) Tetany, rickets, nephritis. (3) Virus infections like whooping cough, measles, etc. Fits may precede the whoop in whooping cough.

(b) *Intracranial causes :* Injury to the head, meningitis, cerebral abscess, venous thrombosis, increased intracranial pressure, etc., may cause convulsions.

Treatment: (1) Combating of hidden infection by anti-biotics. (2) Control of temperature, if necessary, by ice packs. (High temperatures damage the brain). (3) Clearing of the bowels by enema. (4) Anti-convulsants, injection of dial or paraldehyde control the fits. The child should not be allowed to have prolonged convulsions, as the brain may be damaged. The paraldehyde may be repeated every 4 hours. If the child is unconscious for a long period, nasal feeding must be resorted to. Eptoin and phenobarbitone may be administered through the nasal tube.

The child should also be started on phenobarbitone orally. This must be given for a minimum period of two weeks in small doses.

Prognosis: Most of the children get over the tendency for convulsions. About a fifth of them go on exhibiting epileptic tendencies in later life and will need prolonged administration of anticonvulsants.

12. HEADACHE:

Headache is a very common symptom. It is only the lucky few who have never had a headache. The brain is insensitive to pain. Headache is felt in the pain-sensitive structures in the head. They are: 1. The blood vessels inside and outside the skull. 2. The duramater of the base of the skull. 3. The cranial nerves. Headache may be caused by stretching, dilatation or distention of the extra or the intracranial blood vessels. Similarly a stretching of the cranial nerves or the basal dura will cause headache.

Cause of headache:

I. **Reflex headache**: Headache may be caused by a lesion anywhere around the skull.

1. Eye strain.
2. Inflammation in the sinuses.
3. Dental trouble.
4. Osteo-arthritis in the neck, etc.

These cause headache reflexly through the trigeminal and the upper cervical nerves.

II. **General causes**: May lead to headache. It is necessary to recognise them so that proper treatment may be given.

1. *Toxic headache:* A headache may precede a fever by a day or a few hours and continue throughout the fever. This is due to the toxins circulating in the blood causing dilatation of the cerebral blood vessels.

2. *Constipation:* The exact relationship between constipation and headache is not clear. But it is generally true that there is a close relationship between the two. It is likely that a sympathetic tension may cause constipation and headache. It may also be because in constipation histamine like substances accumulate in the intestines and thus cause headache. Relief of constipation often relieves the headache. Enemata as a method of treatment of headache have long been accepted.

3. *Systemic disease:* There are some general systemic diseases whose only initial symptom may be headache. A wise physician thinks of them and thus can give early relief to his patient.

(a) Uraemia. A patient who has chronic urinary trouble may appear to be normal in all respects but may begin to complain of headache. Incipient uraemia is to be suspected. A dry tongue may be seen. Increased urea in the blood will give the diagnosis.

(b) Early hypothyroidism may give rise to headache.

(c) Hypoglycaemia often causes headache. The headache comes a few hours after food.

Correct diagnosis and treatment will give dramatic relief in the above cases.

III. **Hypertension** : This is one of the common causes of headache. The patient may have no other symptom. In every case of headache the blood pressure is to be taken. The headache of hypertension is reduced by rest and increased by any mental or physical strain. The headache is intermittent. There are two types of headache in hypertension.

(a) Occipital headache or headache in the back of the neck. This is due to tension of the neck muscles.

(b) The other headache is due to the stretching of the intracranial blood vessels. The later headache is felt in the temporal region and all over the head. This type is spasmodic and may indicate a high sudden rise in blood pressure. These headaches are treated by reducing the hypertension by hypotensive drugs and by giving sedatives and transquilisers. In severe headache in hypertension, lumbar puncture may give dramatic relief.

IV. **Emotion or anxiety** : The commonest cause of headache is tension or anxiety — chiefly anxiety with an underlying sense of fear or insecurity. Many people react to an unpleasant situation by a headache. This headache starts insidiously and is chiefly in the occipital region and the back of the neck. The pain may then spread forwards to the temporal region. This headache is caused by a constant tension of the neck muscles. In conditions of stress or anxiety, there is a tendency for us to keep the posterior neck muscles tense. This tenseness is the cause of the headache. Hence, if from a careful examination you have excluded other causes of headache, if you find the patient to be under some emotional strain and if the headache is nuchal and spreading forwards, then a diagnosis of a tension headache is justified. Reassurance, sedatives and tranquilisers help to a great extent.

V. **Mental illness** : Some psychoses cause severe headache. There is no apparent organic cause for this headache. The headache is constant throughout the day and night. It does not vary in intensity. It is situated chiefly on the top of the head. There is sleeplessness and depression associated with this headache. Analgesics will not help. Drugs like chlorpromazine (Largactil) will be of benefit in large doses. Otherwise electro- convulsive therapy has been found very useful.

VI. **Migraine** : This entity is well known. The headache is usually unilateral. It may be preceded by visual symptoms like scotoma, scintillating light, etc. It is often accompanied by nausea and vomiting. Vomiting may relieve the headache. In severe cases the patient may have ocular symptoms like the drooping of an eyelid, weakness of a limb, etc.

There is no specific time or reason for this headache. It comes often when the patient is relaxed.

The personality of these patients is interesting. They are of the active aggressive type - the type that are intelligent and want to get on in life.

Epilepsy or asthma may be associated with migraine. The clinical picture is fairly clear to make a correct diagnosis. Sometimes there can be headaches which may not have all these characteristics, but still resemble migraine. These are known as migraine variants.

In all cases of migraine, a thorough examination of the eye function as well as the optic disc is necessary. Migraine headache usually tends to disappear after the age of 30 or 35.

Treatment: (1) Reassurance. (2) Tranquillisers may help. (3) As the cause of migraine is a transient vaso-constriction followed by marked vaso-dilatation, drugs that lead to vaso-constriction are useful. Ergot preparations have been found useful. "Stemetil" is also of benefit.

VII. **Intracranial causes of headache**: Any intracranial lesion that affects the blood vessel or the dura or the nerves will cause headache.

(a) Intracranial tension caused by space occupying lesions is a frequent cause of headache. The characteristics have already been described. In every case of headache, think of intracranial tension.

(b) *Meningitis:* Tubercular meningitis may set in insidiously. Headache may be the only symptom for a few days. This headache should not be missed. A slight pain in the back of the neck, tiresomeness or slight fever may indicate the nature of the trouble. The pain is more severe in the back of the neck and resembles headache due to intracranial pressure. Once meningitis is suspected, examine the fundus and do a lumbar puncture. Do not delay the lumbar puncture.

(c) *Acute attack of headache:* A sudden severe attack of headache especially in a normal young person indicates that he has burst a blood vessel in his brain, i.e., a subarachnoid haemorrhage. The headache is very severe. It spreads down from the head to the back of the neck and spine. The patient may become unconscious or be disoriented with pain. The clinical picture is clear and definite. Lumbar puncture after fundus examination is essential. This will show uniformly blood stained cerebrospinal fluid.

Subarachnoid haemorrhage: Subarachnoid haemorrhage is commonly due to bursting of aneurysms in the brain.

Subarachnoid haemorrhage is treated conservatively for the first few days. Later, it is necessary to investigate and find out what caused this haemorrhage. Cerebral angiography must be done in all cases of subarachnoid haemorrhage. If the aneurysm is accessible, surgery is beneficial.

Note: In every case of sudden acute headache, think of subarachnoid haemorrhage.

Summary: In an examination of a case of headache, enquire into the following:

(1) The duration of the headache. (2) The site of the headache. (3) The direction of spread. (4) The time of the day it is worse. (5) What increases it or decreases it. (6) Assess the personality of the patient. (7) Always do the fundus examination. (8) If indicated, exclude causes like ocular, dental, E. N. T. lesions. (9) Check the blood pressure always. (10) If indicated, do not hesitate to do a lumbar puncture. (11) Exclude organic causes before diagnosing emotional headache.

Conclusion: Every case of headache has to be carefully examined to determine the cause. Every case of headache MUST have a fundus examination done.

13. PAIN RELIEF:

Relief of pain is one of the essential duties of the medical profession. The best way of pain relief is to remove the cause of pain. During the interim period, administration of analgesics is useful.

If the cause of pain cannot be removed, e. g.. malignacy, or cannot be discovered, e. g., trigeminal neuralgia, the problem becomes difficult.

Pain relief in advanced malignancy: Such patients are entitled for relief of pain. The method to be adopted depends on how long the patient may be expected to live. If they are expected to live only for a few weeks or months, then good pain relieving drugs like morphine, pethidine, etc. are indicated. The important principle to be remembered is to give enough of the drugs to relieve pain. The physician should not be afraid of giving large doses of these drugs. A combination of phenothiazine group of drugs (like largactil, melleril, etc., with the pain relieving drugs enhances relief. The drugs may have to be altered frequently to give maximum benefit.

If the life expectancy is longer, other methods of pain relief are to be sought. It is possible to interrupt the pathways of pain conduction and pain appreciation. In cordotomy, the spino-thalamic tract is divided in the spinal cord. As this tract carries pain sensation, pain relief is achieved. This is useful in conditions of malignancy in the pelvis or the lower limbs. Advanced carcinoma of the cervix with secondaries is a strong indication for cordotomy.

In other types of malignancy eg., malignancy of the arm or the face, pain appreciation may be interrupted by the operation of pre-frontal leucotomy. This prevents the patient from appreciating the pain.

Such operations are to be strongly recommended for pain relief, as they give relief not only to the patient but also to the relatives who have to attend on them.

Trigeminal neuralgia: In this condition, there is severe intermittent pain affecting one half of the face. The pain may be so severe as to make the patient even want to commit suicide. The ideal treatment is operation. The sensory root is divided and pain relief occurs. Numbness of the face results, but this is the price that the patient has to pay for pain relief. Prior to operation, injection of the nerve may be tried. Drugs like vitamin B_{12} galsemium and eptoin give temporary relief.

14. SOME IMPORTANT MEDICAL CONDITIONS:

In this section, certain important medical conditions which are commonly encountered, are considered in brief.

Encephalitis: Inflammation of the brain is known as encephalitis. Encephalitis is caused by viruses and may occur in two ways.

(1) *Viral encephalitis:* A virus which has got a special affinity for the nerve cell attacks the nerve cells directly and destroys them. Such a virus is called a neurotrophic virus. Cases of viral encephalitis are not

uncommon in our country. They occur sporadically in all parts of South India. The clinical picture is as follows: A healthy and normal child develops high fever and convulsions. Following this, the child becomes mentally retarded. In addition there may be symptoms like spasticity of the legs and arms, squint, excessive salivation, restless behaviour, incontinence of urine, etc.

Treatment: Unfortunately, there is very little that can be done by way of prevention in sporadic cases.

(1) When a child develops high fever, it may be possible to anticipate the infection and put the child on *broad spectrum antibiotics.* These may help in some cases.

(2) The temperature must be kept down during the attack by means of *ice packs.* This is important, as high temperatures damage the brain.

(3) Convulsions are prevented by anti-convulsants like dial, paraldehyde, hydantoinates and barbiturates.

Prognosis: Such cases are real tragedies. Overnight a bright child gets converted into an idiot and is going to be a life-long burden to the parents. They need support and reassurance during this crisis. In some cases there is a fairly good recovery, but in many some form of retardation persists. Glutamic acid is a favourite prescription in the hope that the remaining brain cells would function better with glutamic acid, which is directly metabolized by the brain cells. Re-education, physiotherapy, massage, speech therapy, etc. are necessary.

(2) *Allergic encephalomyelitis:* In this condition, there is a viral infection in some other tissue of the body, measles, whooping cough, small pox, vaccination, etc. A few days after the infection, neurological symtoms develop suddenly with high fever and convulsions. In this condition, there is no direct involvement of the neurones by the viruses. The myelin sheath surrounding the axons gets degenerated due to an allergic process. This sudden and acute demyelinisation leads to a severe neurological deficit. Treatment is as indicated above for viral encephalitis. Vaccination encephalitis is prevented by vaccinating the child in the early months, i. e., before the 5th month.

Poliomyelitis: This is due to a virus. The anterior horn cells of the spinal cord are affected. The infection is through the intestinal tract. Symptoms are maximal in the beginning and improvement follows. Muscles are paralysed and flaccid. There is no sensory loss. Though it is commonest in children, adults also may suffer from this.

Prevention: Vaccines are available in our country. This prevents poliomyelitis.

Treatment: Once the attack occurs, the muscles have to be supported and treated as mentioned in the chapter on physiotherapy and rehabilitation.

Meningitis: Acute pyogenic meningitis may follow: (a) direct infection like compound fracture of the head, (b) infection from the surrounding areas like an infected mastoid or an infected frontal sinus, (c) from the blood stream by specific organisms like pneumococci, meningococci, influenza bacillus, etc.

The symptoms are acute in onset. Severe headache, restlessness and

fever characterise the onset. Neck rigidity is seen early. In later stages, convulsions and coma occur.

Diagnosis: Every case of severe headache must be examined for neck rigidity and for papilloedema. If the fundus is normal, an *immediate lumbar puncture is absolutely essential.* Cerebro-spinal fluid is usually turbid and in later stages may be purulent. The organisms may be demonstrated by Grams stain and grown in culture. Vigorous antibiotic therapy in very large doses controls the infection. Periodical lumbar puncture and cortisone will prevent post-meningitic complications.

Tuberculous Meningitis: Tuberculous meningitis is a dangerous enemy, as it starts in many disguised forms. Early recognition is very important, as good treatment is available and complete cure can be achieved. If diagnosis is missed in the early stages, though the treatment may eradicate the infection, serious neurological sequelae like blindness, mental retardation, spasticity, unconsciousness, etc. may result.

Tuberculous meningitis is common in our country. It usually occurs in children. Adults also may suffer from it. The early symptoms are variable, e. g., general weakness, lack of interest in play, wanting to lie down too often, headache, lack of apetite, vomiting, low temperature. Any one of these may be the first symptom and when seen in a child, tuberculous meningitis must be suspected. The disease may also start with irregular fever. In general practice, this is often mistaken as typhoid and treated. There is every chance of a typhoid fever getting cured spontaneously, even if the diagnosis is missed. There is no chance of a tuberculous meningitis getting cured spontaneously. So in practice it is wiser to suspect tubercular meningitis as often or more often than typhoid.

Once suspected, lumbar puncture is absolutely essential. The earliest sign is increased cell count in the cerebrospinal fluid. Increase of proteins and reduction of chlorides will occur only in late stages.

Prolonged administration of streptomycine, isonicotinic acid and cortisone are of benefit. If fits occur, they are controlled by small doses of phenobarbitone.

General treatment: General treatment is also to be given. Plenty of vitamins along with good food and bed rest are of value.

Vascular disorders: Cerebrovascular disorders are very common. The chief causes are:

(1) Arteriosclerosis (2) Hypertension (3) Syphilis (4) Aneurysms (5) Embolism from the heart. Recognition is easy from a careful clinical examination. The vascular accident may be either a spasm or a complete block like thrombosis or embolism or a bursting of a vessel like haemorrhage.

Spasm: The symptoms are transient and occur periodically. Hypertension is a common cause. Anti-hypertensive drugs and vaso-dilators like nicotinic acid, priscol, etc are useful. In persistent spasm, intravenous histamine and nicotinic acid have been tried with success. Injection of the cervical sympathetic with novocaine is also said to be of help.

Thrombosis: When the symptoms are persistent, a thrombosis is suspected. In addition to the

usual treatment, the consideration is whether anticoagulants are to be administered, If there is no possibility of haemorrhage, *anti-coagulants* are of value in preventing further progression of thrombosis and serious neurological damage.

Thrombosis may involve also the vessels supplying the brain stem. This is seen in elderly persons. In such cases, the patient complains of attacks of giddiness, transient weakness or numbness in the extremities or transient attacks of incoordination. These cases are to be recognised early. The syndrome is known as *Basilar Artery Syndrome.* This is to be thought of in vague neurological complaints in the elderly and a neurological examination done. Anticoagulants are of benefit in this condition.

Cerebral haemorrhage : Severe cerebral haemorrhage leads to unconsciousness and death. Lumbar puncture will show blood stained cerebrospinal fluid. Fundoscopy must precede lumbar puncture, so that conditions like intracranial tumour or abscess are not missed. The treatment of an unconscious patient has already been indicated. Lowering of the blood pressure, if high, attention to nutrition and rehabilitation after recovery of consciousness are the methods of treatment.

When the haemorrhage is not severe, the clot may accumulate inside the brain in some cases and may delay recovery. Such cerebral clots can be evacuated and recovery hastened. In every case of suspected cerebral haemorrhage, it is necessary to look for signs of intracranial pressure after a few days. Such pressure may indicate an intracerebral clot. By special tests like angiography, such intracerebral clots can be localised and treated.

Extra pyramidal disorders : Parkiasonism : The disorder is due to disease of the basal ganglia. In this condition, the muscles gradually become rigid. There is also an involuntry fine tremor of the limbs. The full blown picture is easy to recognise and is not described here.

The disorder may start in one half of the body or in one limb. Then it may be mistaken for writers' cramp, neurasthenia, monoplegia or hemiparesis. The causes are as follows :

1. Encephalitis.
2. Arteriosclerosis of the vessels supplying the basal ganglia.
3. Degeneration of the ganglia.
4. Head injury.
5. Brain tumours.
6. Metabolic diseases

The first two are the commonest causes.

Treatment: (1) Drugs like belladonna and hyoscyamus have long been used. Later drugs like parpanit, pacitane (Artane) are useful in diminishing the rigidity and tremors. Benadryl is also useful. Ritalin can be given to keep up the morale. The dose and nature of drugs may have to be altered periodically to derive full benefit.

(2) Surgical treatment of Parkinsonism has been well established. Injection of the globus pallidus or the thalamus gives relief. The injection or coagulation is done by a special instrument. The prognosis is good in the younger age group and in unilateral cases. Other types of involuntary movements like muscular dystonia may also be treated by injection of the basal ganglia or the thalamus.

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1. Russek, H.I.: Am. J. Cardiol. 3:547 (April) 1959.

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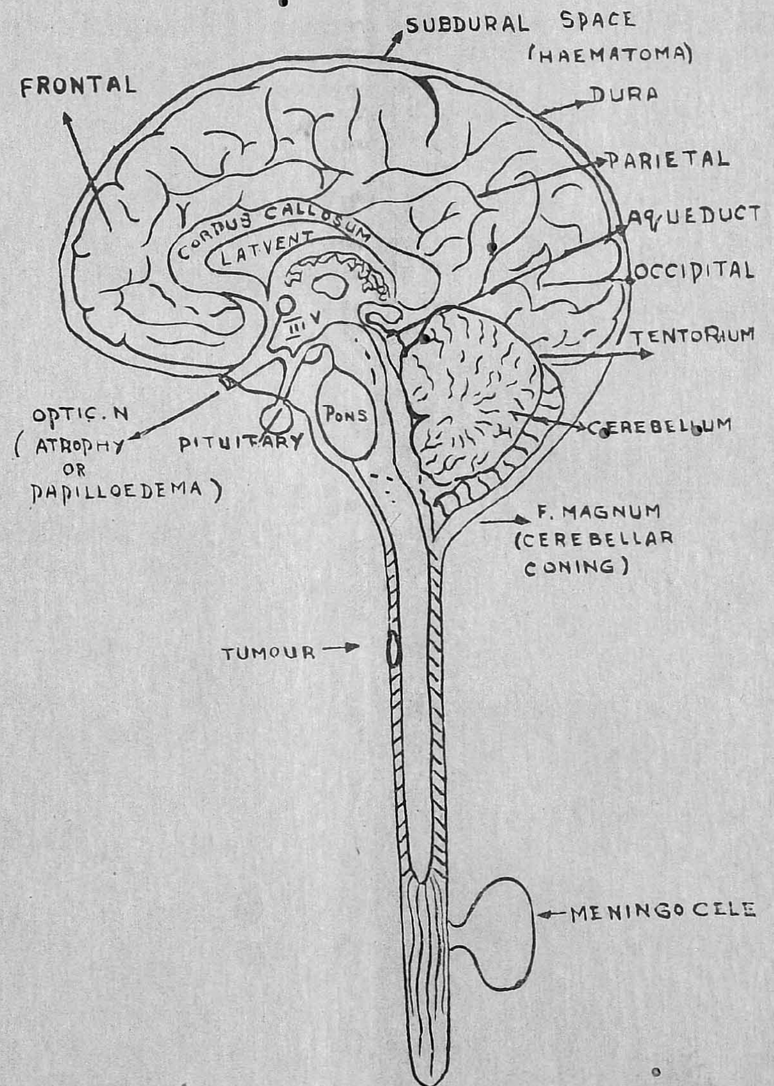

FIG. 1.
Important land marks in the anatomy of the brain and the spinal card.

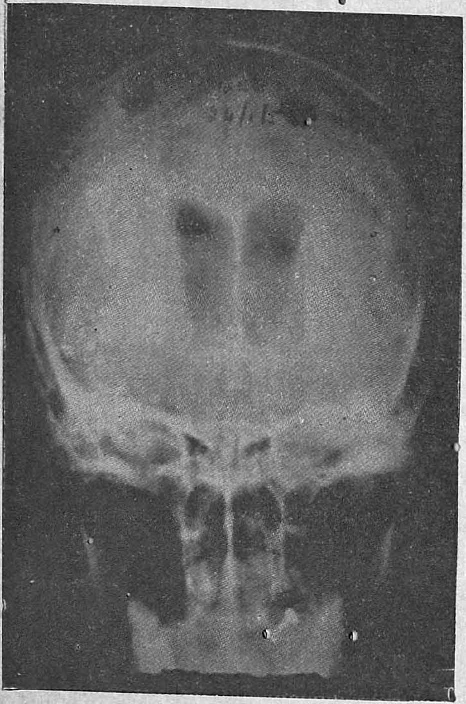

FIG. 2.
Ventriculogram - A. P. view showing the outline of the lateral ventricles.

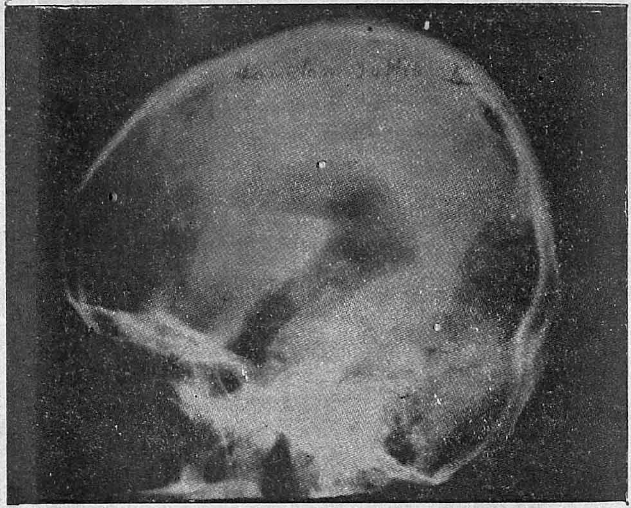

FIG. 3.
Ventriculogram - lateral view.

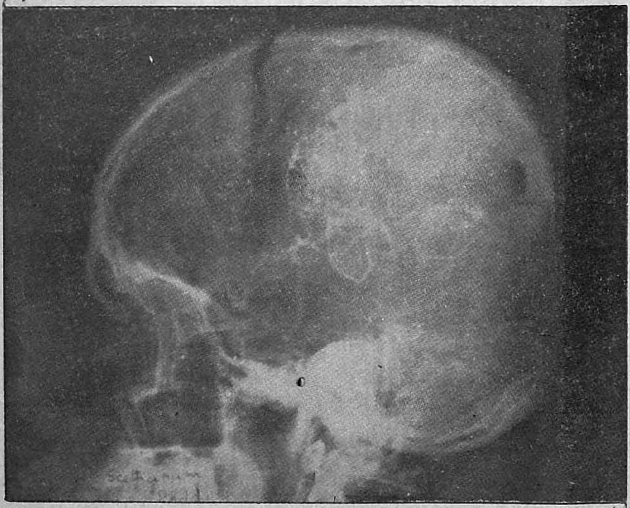

FIG. 4.
Cerebral angiogram - lateral view showing vascular tumour

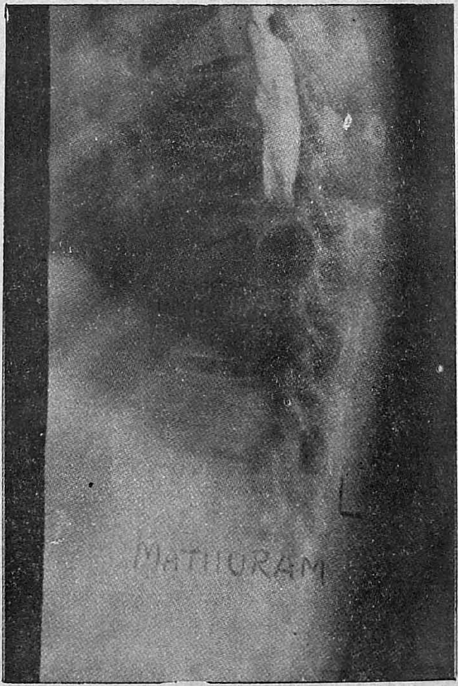

FIG. 5.
Myelogram showing a block due to a spinal tumour.

LETTER TO THE EDITOR:

SEMI-DOCTORS

The recent ministerial pronouncement about "Semidoctors" with a shorter course of training for work as assistants to medical men in rural parts has taken the medical profession by surprise. This is a retrograde step. A little retrospection would convince readers how this step is not desirable.

The rich and middle class people get themselves treated by specialists and they can afford it. Even here, the Government bears the expenses of officials and their families. In these democratic days, the masses are the backbone of social structure. When we talk of the socialistic pattern of society, our poor brethren in the villages must demand great attention.

The word "Semi" in the case of doctors sounds jarring! In view of the opening of many medical colleges all over the country, more doctors are bound to be produced, and their services will be available for the country. It is a well known fact that good many doctors do not go to work in rural dispensaries and hospitals, for want of proper ameneties, emoluments, educational facilities for their children, etc. Thanks to the present administration, the panchayat unions have taken up the responsibility of providing good roads, establishment of schools and hospitals for the amelioration of the masses.

It has been stated that common ailments can be treated by these semidoctors with a short term course. Proper treatment for ailments must be given at the early stages alone by fully qualified and efficient doctors to curb the growth and spread of diseases. A common disease neglected at the primary stage may become virulent and incurable later on. So ailments must be nipped in the bud by fully qualified and efficient men and not by half-baked and ill-backed doctors of the semitype! Even the integrated system of medicine has now been merged and how then can these semidoctors replace the integrated men?

Our Government should see that the graduates alone are put in charge of hospitals and permitted to treat the masses. These semidoctors will do more harm to the country and they will be detrimental to public health. Public health should be the primary charge on the revenues and Government should not grudge to get 'A' class dotors, to look after the human values of the land. Government must give up the scheme of training semidoctors and find ways and means to treat the common man by fully qualified and efficient doctors. Short cuts in medicine are very dangerous and we cannot play and experiment with human lives.

On behalf of the medical profession, and on behalf of the people in whose welfare we are all interested, I like to draw the attention of the powers to the incalculable harm these semidoctors would cause to humanity.

C. NATHAMUNI NAIDU.

NEWS AND NOTES

STEROID PLANT FOR BOMBAY

This week marked an important step in the development of the pharmaceutical industry in India when the foundation stone was laid of the new steroid plant in Bombay for Wyeth Laboratories Limited. The ceremony was performed on 31st October, 1961 by Mr. Frederick J. Cavanaugh, Vice President, Wyeth International Limited, U. S. A. and Mr. K. G. Maheshwari, Managing Director, Geoffrey Manners & Co., Ltd., and Director of Wyeth Laboratories, Limited.

Wyeth Laboratories Limited was registered last year under licence by the Development Wing, Ministry of Commerce & Industry, Government of India, to produce from indigenously available basic material, steroidal hormones such as Prednisolone, Prednisone, Hydrocortisone, Testosterone Propionate, Methyl Testosterone, Ethinyl Oestradiol and Progesterone.

The steroidal hormones play an increasingly important part in modern therapeutics; their value in the control of human population is recognized and it is possible they will provide the key to the treatment of cancer.

The steroid plant at Ghatkopar, Bombay is estimated to cost nearly Rs. 2 crores and when complete next year, will not only save the country foreign exchange of about Rs. 30 lakhs annually, but it is also anticipated that there will be foreign exchange earnings to the extent of nearly Rs. 20 lakhs. This will be possible by the export of fine chemical steroidal intermediates to many other countries in the world - a field in which up till now Mexico enjoyed a near monopoly.

Wyeth is of course, a name known throughout the world and has completed over a hundred years of service to medicine. It is known for its high traditions, its extensive research programmes, its insistence on quality and its dedication to the alleviation of human suffering.

THE 16th MADRAS STATE MEDICAL CONFERENCE, VELLORE, 1961.

The 16th Madras State Medical Conference will be held under the auspices of the North Arcot District Branch of the Indian Medical Association on the 22nd and 23rd of December 1961 at the Christian Medical College, Vellore.

Formal invitations and programme will be sent to the members in due course. All the members are requested to attend the conference and make it a grand success. A very interesting scientific session is being organised. Eminent members from the faculty of the C. M. C. Vellore will take part in the deliberations.

A souvenir containing articles of scientific interest will also be brought out to commemorate the occasion. Those willing to read scientific papers during the conference or contribute articles to the souvenir are requested to inform the undersigned and send their articles on or before 20th November, 1961.

Any further information can be had from the Organising Secretary.

32, Thennamaram Street, Vellore, North Arcot Dt.

T. M. KUMARASWAMY,
Organising Secretary.

REVIEW:

[**Mediscope** — Vol. IV. No. V. August 1961. Third Anniversary Special Number].

It has been a pleasure to go through the hundred and odd pages of this third anniversary number of the "Mediscope". An impressive array of interesting and instructive articles by eminent authors embellish this volume which has been well brought out. Three special articles on obstetrics and gynaecology and two on diseases of the skin and also papers on diabetes, epilepsy, filariasis and two orthopaedic papers find their places in this number.

A very useful monograph on "Gynaeeological and Obstetrical Aspects of Tropical Diseases" by Dr. Vishnu Sarma deserves special mention. The author has taken pains to bring together in this long article all the tropical diseases commonly met with in relation to pregnancy and parturition and gynaecological disorders. The author should be congratulated on his collection of a large number of photographs and figures to illustrate his cases. He has included a very large number of (over 230) references for this short monograph and they would be helpful for the eager student to get a comprehensive knowledge of the subject.

In another short paper on 'Corns and Callosities', Drs. A. N. K. Menon and C. Srinivasan discuss their pathology and their method of treatment with a follow up study of eleven of their patients. The results of study appear to be gratifying, but the period of follow up of these patients has not been given.

This volume is priced at Rs. 3·00 and may be obtained from the Editor, 'Mediscope', 18, Sadulla Street, Madras-17.

— A. G. L.

ERRATA

In the article on "Amoebiasis" by Dr. K. V. Thiruvengadam in our October, 1961 issue Volume xxviii No. 4, the x-ray reduced print of figure 4 in page 114 is to be changed to figure 10 in page 116.

MANAGING EDITOR.

ASSOCIATION NOTES

BRANCH NOTES

Chettinad Branch:

1. At a business session of the tenth annual meeting of the Chettinad Branch of the Indian Medical Association, the following office-bearers for the year 1961—'62 were elected on Saturday the 28th October, 1961 in the Alagappa Training College Hall, College Campus, Karaikudi.

President	:	Dr. S. Subramaniam, M. B., B. S.
Vice-President	:	Dr. A. Vaidyanathan, M. B., B. S.
Hony. Secretary	:	Dr. (Capt.) G. D. Ebenezer, I. A. M. C. (R).
Joint Secretary	:	Dr. P. K. Narayanan, M. B., B. S., T. D. D.
Treasurer	:	Dr. A. Rahman, M. B., B. S., D. L. O.

After the business session, a combined conference of the Madurai and Chettinad Medical Associations was held in the Alagappa Training College Hall, College Campus, Karaikudi at 5 P. M. The following speakers addressed the meeting:

(i)	Dr. G. C. Anbunathan, M. B., B. S., M. R. C. P., D. T. M. & H., D. M. R. Hon. Physician, Government Erskine Hospital, Madurai.	"Vomiting - Significance & management"
(ii)	Dr. K. Bhaskara Rao, M. D., Prof. of Obstetrics and Gynaecology, Madurai Medical College.	"Some obstetrical problems".
(iii)	Dr. K. A. Ramalingam, M. B., B. S., F. R. C. S., Govt. Erskine Hospital, Madurai.	"Some common orthopaedic problems".

2. At the monthly meeting of the Chettinad Branch, Indian Medical Association held on 30—11—1961 in the S. M. S. High School, Karaikudi, the members placed on record their deep concern over the recent proposal of the Health Minister of Madras State to produce Semi-doctors. It was felt unanimously that the Indian Medical Association in particular and the medical profession in general should strongly protest against this move and request the State Government to reconsider the matter.

Nilgiri District Branch:

At the Annual Meeting of the Nilgiri District Branch of the Indian Medical Association held on 28th October, 1961 at the Military Hospital, Wellington, the following office-bearers were duly elected for the year 1961—'62:

President	:	Dr. P. V. Kurian.
Vice - Presidents	:	Dr. K. J. Verghese Dr. Mrs. A. Cheriyan
Secretary	:	Dr. A. V. Ramana Reddy
Joint Secretary & Treasurer	:	Dr. C. S. Srilal

Dr. A. Venkoba Rao, Professor of Psychiatry, Stanely Medical College and Assistant Surgeon, Government Mental Hospital, Madras spoke on "Depressive States in General Practice", and Dr. K. A. Krishnamurthy, Reader in Paediatrics, Madurai Medical College and Paediatric Physician, Erskine Hospital, Madurai spoke on "Pitfalls in the Diagnosis of Some Common Disorders in Infancy and Childhood". A film on "Tropical Sprue" kindly made available by M/s. Burroughs Wellcome & Co., Bombay was projected.

STATE SECRETARY'S ANNOUNCEMENT

The State Council of the Madras State Branch of I. M. A. has, at its meeting held at Thiruvithamcode, Kanyakumari district, on 30th September 1961, declared the following office-bearers to have been duly elected for the respective offices for the year 1961—'62 :—

President : Dr. C. Nathamuni Naidu, L. M. (Dub.), Z. T. D. (Vienna), The Poly Clinic, Ambur, North Arcot district.

Vice-President : Dr. T. V. Sreenivasan, M. B. B. S., Pugalia Pillai Street, Tiruchirapalli-2. (Senior Vice-President)

Dr. V. Samuel, L. M. P., Myrtle Cottage, 40, Tana Street, Vepery, Madras-7. (Vice-President)

They will assume office from the 1st day of the 16th Madras State Medical Conference.

The 16th Madras State Medical Conference will be held under the auspices of the North Arcot Branch of the Indian Medical Association on the 22nd and 23rd of December 1961 at the Christian Medical College campus, Vellore, North Arcot district. A Reception Committee has been formed with Dr. J. S. Carman, Director of the Christian Medical College, Vellore, as Chairman, and Dr. T. M. Kumaraswami as the Organising Secretary. A very interesting scientific session is being is being organised, and eminent members from the faculty of the Christian Medical College, Vellore, will take part in the deliberations. A Souvenir will also be brought out to commemorate the occasion.

All the local branches of I. M. A. in the State as well as all the members of the I. M. A. are requested to kindly extend their hearty cooperation to the organising branch and make the conference a grand success.

Members requiring any information pertaining to the conference are requested to kindly contact "Dr. T. M. Kumaraswami, D. M. & S., L. O., Organising Secretary, 16th Madras State Medical Conference, 33, Thennamaram Street, Vellore, N. Arcot Dt."

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